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EXAMINER	
ARTMAN, THOMAS R	
ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 06/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/873,726	AHLERS ET AL.	
	Examiner	Art Unit	
	Thomas R Artman	2882	

-- The MAILING DATE f this communication appears on the cover sheet with the correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 February 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6, 8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 2, 4, 7 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Oshima (US 5,932,139).

Regarding claim 1, Oshima discloses a fluorescing portion of a document and a device that illuminates the document and detects the fluorescence, including:

1) a feature that is a fluorescent material with a specific excitation wavelength and may respond at a different wavelength and is detected by a detector,

2) an evaluation unit to process the detected signal,

3) a slit and imaging optics to form a bar-shaped illumination beam (Figs.4 and 33) that evenly illuminates the width of the fluorescent portion of the feature, and

4) the response pulse from the fluorescent portion of the feature follows the excitation pulse with a defined time delay, and the pulses are measured taking the delay and slit dimensions into consideration.

With respect to claim 2, the document is moved past a window at an approximate right angle to the direction of illumination.

With respect to claim 4, Oshima's device and dyes are designed to use the down-conversion effect, where the response pulse light is at a lower frequency than the excitation frequency.

In regards to claim 7, Oshima teaches, in col.2, lines 7-10, that the fluorescing pigments are often added as part of an ink as an applied solution to an object.

Regarding claim 26, Oshima uses a high pass filter (Fig.65) for filtering undesirable data.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima and in view of Voser (US 6,172,745).

Oshima does not disclose a position sensing aspect of his detection device for "position-resolved detection."

Voser, in col.7, lines 43-48, describes the use of such a detector (Fig.3, item 72) in his sensing device. The sensor is used to detect the presence of a bank note and it's orientation

along the transport direction such that the sensing elements will have information on the document's position for proper timing of illumination. Also, the pattern recognition circuitry would be able to better match the stored reference patterns to the detected pattern. All of this would result in improved accuracy.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to include position detectors for proper timing of the devices and more accurate pattern recognition.

Claims 9-17 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima and Voser and in view of Hopwood (US 5,915,518).

With respect to claim 9, the previous references do not disclose sensors that detect two different spectral bands with one illumination. Hopwood teaches the use of a detection means (Fig.1) that illuminates a document with UV light and detects the reflected UV and the fluorescence, which occurs in a different band than UV. In col.2, lines 35-45, Hopwood states that detecting the reflected and fluorescing light allows for improved accuracy for the detection of fraudulent bank notes because the reflectivity properties in the UV band can vary as well as the fluorescence. However, if one of the results (such as UV reflectance) is similar between a counterfeit and genuine document, the other (fluorescence) is different, and vise-versa.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to detect multiple spectral bands with one illumination source for improved accuracy of detecting fraudulent documents using fluorescing pigments.

In regards to claims 10 and 28, Hopwood uses a UV light source, and specifies a range of 300-400nm (col.2, lines 37-38), where the reflectivities vary between genuine and counterfeit documents when illuminated in this range. This allows another avenue for fraud detection as described against claim 9.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a UV light source for the detection of fraudulent documents using fluorescing pigments. Further, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use this additional feature onto Oshima's detection system for improved flexibility and reliability.

With regards to claim 11, Voser's sensor as described against claim 8 is used for the exact purpose of sensing the beginning, end and position of a bank note relative to the transport path. In this way, the illumination and detection optics will be better timed for sampling images of the document for pattern recognition, and the length of the document can be measured as an additional security feature as taught by Voser. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to include position detectors for more accurate detection of fraudulent documents.

With respect to claim 12, Oshima discloses using pigments that are acceptable for excitation pulse periods of 1 ms (col.44, lines 33-45), which would make the pigment response pulse to be, at most, roughly 0.5ms, which is on the order of 0.1ms response pulse time.

With respect to claims 13 and 14, Oshima discloses a number of pigments that have excitation wavelengths in the IR band. One with ordinary skill in the art would appreciate that the choice of wavelength depends upon the pigment, and Oshima's pigments use IR excitation wavelengths. Furthermore, the wavelengths are simply a design choice and obvious without the criticality of a specific kind of pigment being used in conjunction with the specified excitation wavelengths.

In regards to claim 15, Oshima discloses the use of a cylindrical lens in order to form a bar-shaped illumination beam. A typical light source, such as an LED or laser diode, is essentially a point source with light radiating outward, or diverging. It would be appreciated by one skilled in the art that, when divergent light is incident upon a cylindrical lens, a bar-shaped beam will result such that the center will have the highest intensity and the outer ends of the light beam will have the lowest intensity. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use cylindrical lenses to focus a light beam into the shape of a bar, and the intensity would naturally be highest in the middle.

With respect to claims 16 and 17, the structure as applied against claim 15 applies here and the following. Both claims define variations on the shape of the cross-section of the cylindrical lens of claim 15 (claim 16 is aspherical, claim 17 is sinusoidal). These shapes perform the same function of providing a bar-shaped illumination beam of varying thicknesses and are considered functional equivalent substitutions that would have been obvious to one

skilled in the art at the time the invention was made. Furthermore, the use of aspherical optics is well known for reducing imaging aberrations, etc.

With regards to claim 29, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the signet detector is an optical barrier. Anything that disrupts the propagation of the optical signal, such as a photodetector, would be considered an optical barrier to one skilled in the art.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima, Voser and Hopwood, and in view of Schwartz (US 6,371,374).

In regards to claim 18, Schwartz uses an array of cylindrical lenses (Fig.2, item 67) to improve the intensity at the outer edges of the bar-shaped beam such that the barcode scanner would accurately decipher the outlying lines of long bar codes.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use an array of cylindrical lenses in order to increase the intensity at the edges of a laser line for improving the detection capabilities of the device for detecting signets near the ends of the bar-shaped light beam.

Claims 19-24 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima, Voser, Hopwood and Schwartz, and in view of Cherney (US 2001/0006066).

With respect to claim 19, the structure as applied against claim 18 above applies here and the following. Cherney discloses a reflective cone based upon total internal reflection for

concentrating light from the sun onto a solar cell. In this way, the cell is more efficient in that the higher intensity corresponds to higher output. Also, Voser teaches the advantages of a metal coating on a light guide to improve containment of the light and the rejection of any ambient light contaminating the excitation wavelengths. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a cone-shaped reflector that is either transparent or metal-coated for increasing the intensity of the fluorescing light in order to improve the performance of the sensor. The higher the intensity is, the more precise the device will be for detecting and identifying specific wavelengths.

In regards to claim 20, the structure as described against claim 19 applied here and the following. Photomultipliers are common devices for light detection that further intensify the signal for accuracy, and therefore it would have been obvious to one skilled in the art at the time the invention was made to use them for detecting fluorescing light from a signet.

With regards to claim 21, the structure as described above against claim 20 above applied here and the following. Voser discloses the practice of detecting specific regions of a bank note and the use of lenses (Fig.1, item 20) to focus that portion of light on a respective photodetector (item 12). In this way, a higher degree of accuracy can be achieved for fraud detection such that many parts of the bank note are analyzed separately. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide for imaging portions of a scanning line to better locate and identify the signet.

With respect to claim 22, the structure as described against claim 21 above applies here and the following. Voser's array of lenses and corresponding photodetectors are arranged along the line of illumination close to the bank note for the simple reason that the light to be detected is going to originate from that region. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to stack such assemblies in an array along the illumination line such that the fluorescent light can be detected.

Regarding claim 23, the structure as described against claim 21 above applies here and the following. Adding a reflecting cone behind each lens to further direct light to the corresponding photodetector is a rearrangement of parts that would have been obvious to one of ordinary skill in the art at the time the invention was made. To use one reflective cone on a detector or to use several cones on corresponding detectors is equivalent and obvious to do so.

With respect to claim 24, Oshima teaches the use of beam splitters for splitting off portions of an optical beam.

In regards to claim 30, the use of the term "reflection cone" to describe the combination of the cylindrical lens and the funnel-shaped reflector is arbitrary, and the prior art combination cited above can be equally referred to as a "reflection cone" to one with ordinary skill in the art.

Claims 3 and 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima and in view of Kaule (US 4,451,521).

With respect to claim 3, Kaule teaches the precedence of pigments that can be detected using the "up-conversion" effect, where the fluorescent wavelength is shorter (the frequency is higher) than the excitation wavelength. In col.2, lines 40-47, Kaule states that such pigments, illuminated in the IR range and fluoresce in the visible, for example, have existed for some time for testing documents for genuineness. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement such pigments in a document for forgery detection.

With respect to claim 5, Kaule teaches the precedence of pigments that can be detected at the same wavelength as the excitation wavelength. Such pigments do exist and are known for use as security measures on documents, for example, starting in col.4, line 63, to fluoresce in the UV range when excited with UV light, and as another example, starting in col.5, line 55, to fluoresce in the IR range when excited with IR light. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to implement such pigments in a document for forgery detection.

Regarding claim 6, it would have been obvious to one of ordinary skill in the art at the time the invention was made that using a dye as described in claim 5 must be detected with a delay. Otherwise, the detector would not be able to distinguish the excitation source intensity/pattern from the response intensity/pattern.

Regarding claims 7-24 and 26-30 under the combination of Oshima and Kaule, claims 7-24 and 26-30 stand rejected, since it is the examiner's opinion that the addition of Kaule to reject claims 3 and 5 can still be combined with the remaining references used against claims 7-24 and 26-30 elsewhere in this Office action.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oshima and Kaule and in view of Liang.

Though the timing of the detection systems are not expounded upon in Oshima and Kaule, Liang teaches the timing of the detector signal sampling to follow the excitation pulses, which are synchronized with the movement of the document or sensor system. One skilled in the art would appreciate that such a system, being advantageous with other fluorescing pigments, would find these teachings to be not only obvious, but also invaluable to the success of using such pigments.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use such a synchronized system when using pigments with excitation and response pulses of the same wavelength. This is really the only reasonable way an evaluation system is enabled to discriminate between the excitation pulse and the response pulse for pigments whose excitation and response wavelengths are the same. If the sampling and excitation times were simultaneous or overlapping, then the evaluation system would not be able to discriminate between the excitation and response pulses at all, or with very low accuracy at best.

Response to Arguments

The examiner agrees with the applicant that the prior art combinations relying upon De Man et al. do not disclose or reasonably teach the additional limitation of detection with a defined time delay. The new prior art references cited above, Oshima and Liang, have teachings that reveal rudimentary time-gating type methods for more accurate detection of the response pulses from the fluorescing pigments.

Regarding the re-used prior art references, the examiner respectfully disagrees on two counts. First, the use of the Schwartz reference for an obviousness teaching for using cylindrical lens arrays is analogous art. Although it does not detect response pulses from fluorescing pigments, the bar-code reader is a common object that optically detects a printed pattern using a bar-shaped scan line. It is advantageous for such scanners to have even illumination, as argued above, such that wider bar codes can be used (the cited patent discloses the bar code scanners that every patent examiner has for scanning the rather long bar codes on the file wrappers of patent applications).

Second, the use of the Cherney reference for the teaching of reflective cones is also analogous art. Though the application in Cherney is for the visible spectrum, it teaches a well-known concept of using funnel-shaped reflectors for collecting as much light as possible. It is also well-known in the electromagnetic propagation field that reflective cones, horn antennas, and waveguides in general have dimensions that are scaled to the wavelength(s) they are designed to propagate. Therefore, the general teaching of using a reflective cone to enhance

incident visible light would be easily construed to other wavelength bands by one skilled in the art.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Liang (US 5,574,790) teaches the practice of using multiple wavelength sources within the same document discrimination device. Cyr (US 5,959,296) teaches of another fluorescing pigment detector.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas R Artman whose telephone number is (703) 305-0203. The examiner can normally be reached on 8am - 5:30pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Thomas R. Artman
Patent Examiner
June 2, 2003

DAVID V. BRUCE
PRIMARY EXAMINER